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L6: Entry 3 of 3

File: DWPI

Aug 19, 1994

DERWENT-ACC-NO: 1994-306400

DERWENT-WEEK: 199438

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TITLE: Gallium nitride cpd semiconductor used in blue light emitting diode and blue laser prodn. - incorporates p type impurity doping on electrode with 20 microns width formed on gallium nitride compound and annealing

PATENT-ASSIGNEE:

ASSIGNEE

NICHIA KAGAKU KOGYO KK

CODE

NICHN

PRIORITY-DATA: 1993JP-0039359 (February 2, 1993)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 06232450 A	August 19, 1994	N/A	005	H01L033/00

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP06232450A	February 2, 1993	1993JP-0039359	N/A

INT-CL (IPC): H01L 33/00

ABSTRACTED-PUB-NO: JP06232450A

BASIC-ABSTRACT:

Gallium nitride compound semiconductor is formed on a substrate over which a buffer layer is formed. N type gallium nitride layer is formed on the buffer layer. The substrate is then sized on one side and a part is taken out in the upper surface so that a step like structure is formed.

In the cut portion of GaN layer, i.e in the lower step n type electrode is formed. In the uncut portion of GaN layer, i type GaN layer (4) is formed. Next, p type impurity is doped on GaN layer. P type electrode (6) of width 20 microns or less is formed on GaN layer and annealing is carried out at 400 deg.C or more.

ADVANTAGE - Provides excellent emission characteristics. Improves ohmic contact nature of electrode. Delivers excellent

semiconductor cpd amenable to different applications.

CHOSEN-DRAWING: Dwg.3/7

TITLE-TERMS: GALLIUM NITRIDE COMPOUND SEMICONDUCTOR BLUE LIGHT
EMIT DIODE BLUE LASER PRODUCE INCORPORATE P TYPE IMPURE DOPE
ELECTRODE MICRON WIDTH FORMING GALLIUM NITRIDE COMPOUND ANNEAL

DERWENT-CLASS: L03 U11 U12

CPI-CODES: L04-A02; L04-E03A; L04-E03B;

EPI-CODES: U11-C05F6; U12-A01A1A; U12-A01A2;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1994-139593

Non-CPI Secondary Accession Numbers: N1994-241023

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L6: Entry 2 of 3

File: DWPI

Jul 2, 1999

DERWENT-ACC-NO: 1999-436034

DERWENT-WEEK: 200029

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TITLE: Doping method for palladium electrode in a blue LED - involves forming palladium electrode on a P-type gallium nitride semiconductor layer, which is then post-heat treated at specific temperature for preset time period

PATENT-ASSIGNEE:

ASSIGNEE

CODE

SHARP KK

SHAF

PRIORITY-DATA: 1997JP-0343524 (December 15, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 11177134 A	July 2, 1999	N/A	005	H01L033/00

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 11177134A	December 15, 1997	1997JP-0343524	N/A

INT-CL (IPC): H01L 21/28; H01L 33/00; H01S 3/18

ABSTRACTED-PUB-NO: JP 11177134A

BASIC-ABSTRACT:

NOVELTY - A hydrogen permeable Pd electrode (104) is formed on a GaN group semiconductor layer (103) on which a P-type dopant is formed at about 4-1000 nm thickness. Post-heat treatment is performed at about 700 degreesC for 10 minutes in inert gas atmosphere such as nitrogen or argon.

DETAILED DESCRIPTION - Over a sapphire substrate, an N-GaN layer (102) which is doped by Si, is formed to a thickness of 4 microns. To the N-GaN layer (102), a GaN impurity (103) doped by Mg at about 1×10^{20} cm⁻³ thickness is formed at a thickness of 1 micron.

An INDEPENDENT CLAIM is also included for palladium electrode doping structure.

USE - For blue LED manufacture.

ADVANTAGE - A good ohmic contact is obtained between metal and semiconductor, thus avoiding damage to the film by high temperature processing.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic diagram of hydrogen permeation property Pd electrode formed on N-GaN layer. (102) N-GaN layer; (103) GaN group semiconductor layer; (104) Hydrogen permeation property Pd electrode.

CHOSEN-DRAWING: Dwg.1/4

TITLE-TERMS: DOPE METHOD PALLADIUM ELECTRODE BLUE LED FORMING PALLADIUM ELECTRODE P TYPE GALLIUM NITRIDE SEMICONDUCTOR LAYER POST HEAT TREAT SPECIFIC TEMPERATURE PRESET TIME PERIOD

DERWENT-CLASS: L03 U11 U12 V08

CPI-CODES: L04-A02; L04-C10E; L04-C11A; L04-C11C; L04-C16; L04-E03A;

EPI-CODES: U11-C05F6; U12-A01A2; U12-A01B1B; U12-A01B6; V08-A01A; V08-A01D; V08-A04A;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1666U

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1999-128408

Non-CPI Secondary Accession Numbers: N1999-325354

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,JPAB,EPAB,DWPI,TDBD	11 and 12 and 13 and (nichrome or NiCr or nickel chromium)	2	<u>L11</u>
USPT,JPAB,EPAB,DWPI,TDBD	14 and (nichrome or NiCr)	0	<u>L10</u>
USPT,JPAB,EPAB,DWPI,TDBD	17 with 15	17	<u>L9</u>
USPT,JPAB,EPAB,DWPI,TDBD	17 and 15	84	<u>L8</u>
USPT,JPAB,EPAB,DWPI,TDBD	11 near3 13	237	<u>L7</u>
USPT,JPAB,EPAB,DWPI,TDBD	11 with 12 with 13 with 15	3	<u>L6</u>
USPT,JPAB,EPAB,DWPI,TDBD	(heat near4 treat\$4) or anneal\$4	378308	<u>L5</u>
USPT,JPAB,EPAB,DWPI,TDBD	11 with 12 with 13	135	<u>L4</u>
USPT,JPAB,EPAB,DWPI,TDBD	electrode	1062241	<u>L3</u>
USPT,JPAB,EPAB,DWPI,TDBD	(light emitting diode) or LED	303646	<u>L2</u>
USPT,JPAB,EPAB,DWPI,TDBD	(gallium nitride or GaN)	7728	<u>L1</u>